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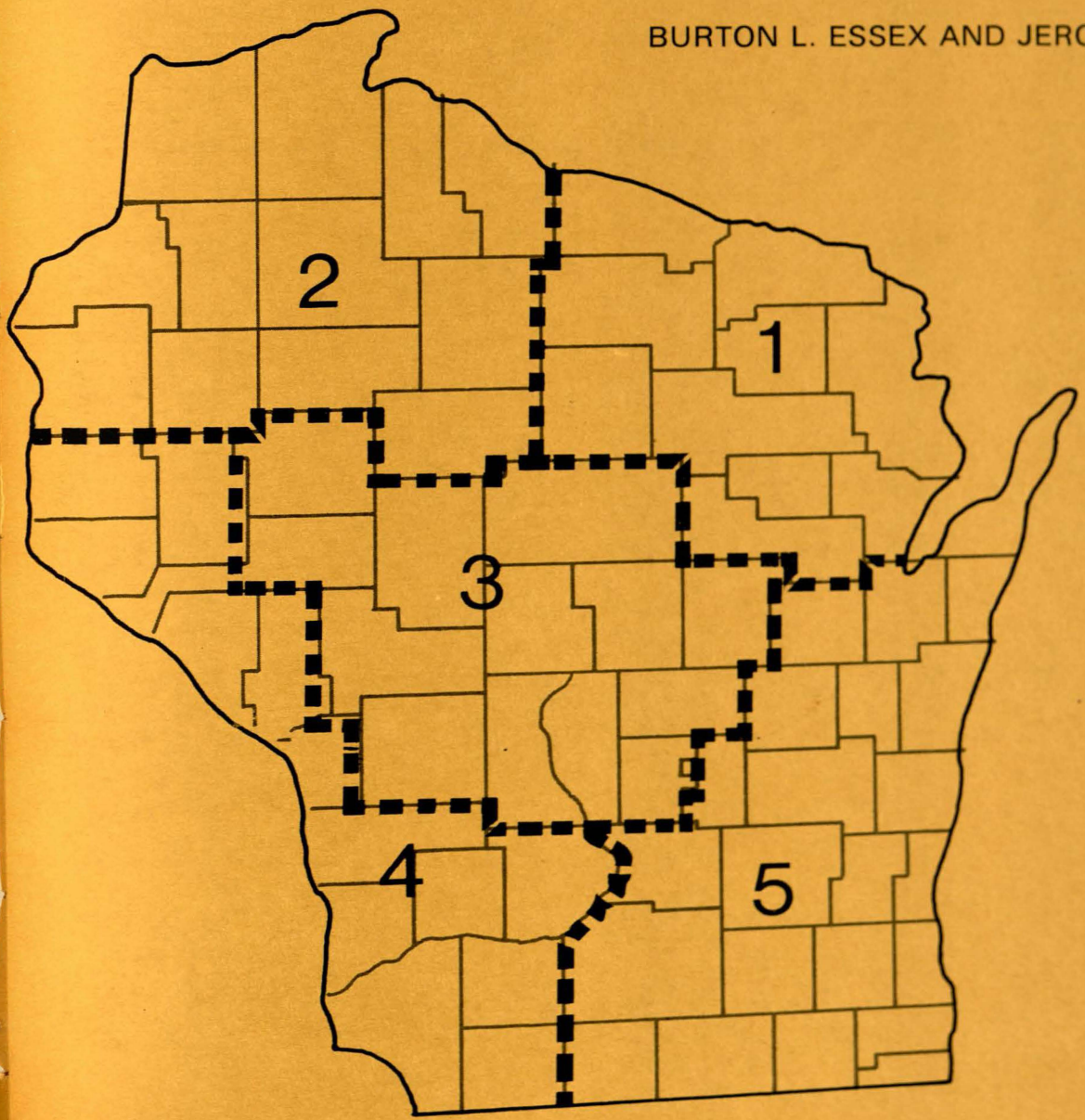
EMPIRICAL YIELD TABLES FOR WISCONSIN

BURTON L. ESSEX AND JEROLD T. HAHN



NORTH CENTRAL FOREST EXPERIMENT STATION
FOREST SERVICE

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This paper presents 18 yield tables compiled from data gathered on 5,725 sample plots established during the 1968 inventory of Wisconsin's 5 Forest Survey Units shown in figure 1. Tables 1-12 give estimated volume per acre yield from growing-stock trees and average basal area per acre of all live trees for the 12 forest types defined on page 21. Tables 13-18 give such yields for the aspen forest type by site index classes. These tables provide a detailed picture of stand composition as measured by growing-stock volume.

Figure 1.--*Forest Survey Units in Wisconsin.*

The information presented in these tables can be used in several ways. It can be used to estimate future timber yields if one assumes that the yields shown for trees in one age class will increase in 10 years to the yields shown for the next older age class.

These tables also can be used to obtain comparative volume estimates for progressive rotation ages. For example, the aspen type occupied 3,665 M acres in Wisconsin in 1968.[1] If you harvested an equal number of acres each year, depending upon the selected rotation, the annual harvest volume estimates could be derived as follows using the yields shown in table 11:

Rotation age
35 years: 104.7 M acres X 812 ft^3=85 MM ft^3
45 years: 81.4 M acres X 1,050 ft^3=85.5 MM ft^3
55 years: 66.6 M acres X 1,104 ft^3=73.5 MM ft^3

The basal area values in these tables can be used to determine whether existing stands are stocked to their full potential because such values provide a measure of stand density when related to stand age. For example, in 1968 there were approximately 62,000 acres of aspen 50 to 60 years old in the 60 to 70 site index class in Wisconsin.[1] Yields in these stands (all species) averaged 1,254 ft^3 per acre and basal areas (growing stock and cull trees combined) averaged 97 ft^2 (table 15). Thus, the ratio of volume to basal area is 12.9 to 1. Schlaegel[2] predicts that such a ratio for stands of aspen in Minnesota on similar sites and of the same age would be 25.4 to 1. If we view Schlaegel's prediction as an index of stand potential, we can generalize that similar aspen sites in Wisconsin could be expected to yield roughly twice as much as these stands are producing now.

The values shown in tables 1-18 were obtained from plots established in stands that ranged from the undisturbed state to stands that had been cut repeatedly. Thus standard errors of mean volume are given in the tables to indicate this variation. Sampling errors in percents can be determined by dividing the standard error by the mean volume. For example, the sampling error for jack pine in the 41 to 50 year age class (table 1) is ± 7.5 percent ([68.89 ft^3 ÷ 921.72 ft^3] x 100).

For each forest type, sets of seven tables (six site classes and a summary table that combines all site classes) are available giving Statewide values or Forest Survey Unit values (see figure 1) from the North Central Forest Experiment Station. They may be obtained by using the Order Form in the rear of this publication, which should be addressed to: PUBLICATIONS, North Central Forest Experiment Station, Folwell Avenue, St. Paul, Minnesota 55108.

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[1] *Spencer, John S., Jr., and Harry W. Thorne. 1972. Wisconsin's 1968 timber resource--a perspective. USDA For. Serv. Resour. Bull. NC-15, 80 p., illus. North Cent. For. Exp. Stn., St. Paul, Minn.*

[2] *Schlaegel, Bryce E. 1971. Growth and yield of quaking aspen in north-central Minnesota. USDA For. Serv. Res. Pap. NC-11 p., illus. North Cent. For. Exp. Stn. St. Paul, Minn.*

Table 1.--*Estimated volume per acre yield for growing-stock trees for jack pine forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	0	2.19	6.13	0	36.91	47.27	69.00	0	0	0	0	0	10.32
Red pine	2.90	5.17	32.22	18.58	27.30	59.88	108.63	0	0	0	0	0	22.20
Jack pine	57.89	139.96	293.11	537.52	778.72	816.29	641.63	0	0	0	0	0	393.27
White spruce	0	0	0	0	0	0	0	0	0	0	0	0	0
Black spruce	0	0	1.76	0	1.76	45.51	11.98	0	0	0	0	0	3.01
Balsam fir	0	0	0	0	1.53	0	0	0	0	0	0	0	.20
Hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0
Tamarack	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern white-cedar	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	60.78	147.33	333.22	556.11	846.24	968.94	831.24	0	0	0	0	0	429.00
HARDWOODS													
White oak	0	.57	0	2.42	0	0	0	0	0	0	0	0	.72
Select red oak	0	0	7.20	9.36	3.41	0	45.43	0	0	0	0	0	5.35
Other red oak	7.22	8.81	9.79	15.85	15.02	7.50	30.72	0	0	0	0	0	11.79
Hickory	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow birch	0	0	0	0	0	0	0	0	0	0	0	0	0
Hard maple	0	0	0	0	0	0	0	0	0	0	0	0	0
Soft maple	0	0	0	0	0	0	0	0	0	0	0	0	0
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	0	0	0	0	0	0	0	0	0	0	0	0	0
Balsam poplar	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper birch	0	0	8.26	1.54	0	0	12.89	0	0	0	0	0	2.61
Bigtooth aspen	0	2.04	4.54	4.04	21.27	35.42	0	0	0	0	0	0	7.02
Quaking aspen	6.26	1.20	17.28	23.33	35.79	65.89	39.55	0	0	0	0	0	19.50
Basswood	0	0	0	0	0	0	0	0	0	0	0	0	0
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	0	0	1.06	0	0	0	0	0	0	0	0	0	.26
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	13.48	12.61	48.14	56.53	75.49	108.81	128.59	0	0	0	0	0	47.25
Total all species	74.27	159.94	381.36	612.64	921.72	1,077.75	959.83	0	0	0	0	0	476.25
Number of plots	30	56	67	69	37	13	5	0	0	0	0	0	277
Standard error	16.10	19.76	34.95	40.71	68.89	121.61	89.99	0	0	0	0	0	25.30
Average basal area	19	41	63	68	77	83	84	0	0	0	0	0	58

[1] See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 2.--*Estimated volume per acre yield for growing-stock trees for red pine forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	12.16	5.55	51.91	46.55	410.79	148.64	431.37	460.09	400.46	1,138.04	0	0	92.18
Red pine	27.89	129.49	529.08	794.83	605.45	957.21	1,114.11	1,505.15	1,693.96	1,071.39	0	0	429.86
Jack pine	15.71	23.07	16.48	138.42	55.32	117.51	11.70	0	19.24	0	0	0	33.25
White spruce	0	0	7.28	0	16.42	17.06	0	0	17.92	0	0	0	4.03
Black spruce	0	1.71	0	0	73.77	29.55	45.74	0	0	63.08	0	0	8.01
Balsam fir	0	0	2.60	0	67.21	50.41	91.51	0	0	255.94	0	0	13.59
Hemlock	0	0	0	0	0	0	43.81	0	0	0	0	0	2.31
Tamarack	0	0	0	0	0	23.24	0	0	0	0	0	0	1.63
Northern white-cedar	0	0	0	0	0	13.59	10.90	0	0	0	0	0	1.53
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	55.76	159.82	607.33	979.80	1,228.97	1,357.22	1,749.14	1,965.25	2,131.59	2,528.46	0	0	586.39
HARDWOODS													
White oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Select red oak	0	0	15.46	0	14.62	0	17.07	196.75	45.46	0	0	0	8.13
Other red oak	3.95	10.52	7.80	0	11.95	0	0	0	21.90	0	0	0	6.35
Hickory	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow birch	0	0	0	0	0	0	0	0	0	0	0	0	0
Hard maple	0	0	4.67	0	0	0	0	0	0	40.74	0	0	1.51
Soft maple	2.18	0	0	0	11.57	4.19	0	0	40.16	0	0	0	2.33
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	0	0	0	0	0	0	0	0	0	0	0	0	0
Balsam poplar	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper birch	0	5.14	7.05	0	14.45	48.22	58.91	178.74	38.08	375.38	0	0	15.76
Bigtooth aspen	0	0	0	0	0	25.81	24.57	356.58	85.61	0	0	0	8.49
Quaking aspen	16.22	0	50.75	14.35	182.92	184.21	110.75	0	75.30	226.32	0	0	46.76
Basswood	0	0	0	0	0	0	0	0	0	0	0	0	0
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	0	0	4.81	0	0	0	0	0	0	0	0	0	1.18
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	22.35	15.66	90.53	14.35	235.50	262.44	211.30	732.08	306.50	642.44	0	0	90.49
Total all species	78.12	175.48	697.86	994.15	1,464.47	1,619.66	1,960.45	2,697.33	2,438.09	3,170.89	0	0	676.89
Number of plots	30	26	28	7	4	8	6	1	3	1	0	0	114
Standard error	34.90	50.36	78.41	126.10	395.08	190.04	306.17	R	492.68	R	0	0	75.42
Average basal area	12	58	78	93	104	112	118	146	120	195	0	0	65

[1] See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 3.--*Estimated volume per acre yield for growing-stock trees for white pine forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	0	236.32	241.45	431.78	510.33	708.51	1,060.71	786.87	875.47	1,749.25	2,058.55	2,707.69	805.98
Red pine	0	69.31	46.52	175.37	89.89	165.19	166.34	45.31	245.59	35.69	157.89	36.78	112.04
Jack pine	0	0	11.47	22.29	49.51	37.05	57.62	12.08	9.94	0	0	0	22.75
White spruce	0	0	0	0	0	33.18	65.84	0	9.73	0	31.33	0	14.30
Black spruce	0	0	0	9.96	19.24	44.57	0	18.03	0	0	0	0	10.61
Balsam fir	0	0	0	0	6.80	96.76	28.65	74.38	27.03	0	87.91	0	28.85
Hemlock	0	0	0	0	12.45	0	13.54	18.25	0	0	0	91.55	10.71
Tamarack	0	0	0	0	51.31	0	0	11.97	0	0	22.74	0	8.59
Northern white-cedar	0	0	18.37	0	0	0	0	8.48	0	0	0	199.30	15.23
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	305.63	317.80	639.41	739.53	1,085.26	1,392.69	975.38	1,167.75	1,784.94	2,358.42	3,035.32	1,029.04
HARDWOODS													
White oak	0	0	0	24.60	5.73	0	0	9.66	6.80	0	83.52	0	7.38
Select red oak	0	0	0	0	6.87	19.26	59.91	0	25.74	0	86.97	63.76	20.53
Other red oak	0	0	0	11.18	8.20	21.61	0	25.68	0	26.05	20.94	22.70	9.84
Hickory	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow birch	0	0	0	0	0	0	0	0	0	0	0	0	0
Hard maple	0	0	0	0	0	0	0	0	36.36	0	19.08	26.37	5.84
Soft maple	0	0	0	0	24.22	18.75	14.92	34.63	76.41	0	129.95	233.33	37.67
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	0	0	0	0	0	0	0	25.39	30.82	0	0	0	4.84
Balsam poplar	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood	0	0	0	0	0	0	9.03	0	0	0	0	0	1.07
Paper birch	0	0	10.25	32.53	88.37	32.30	29.96	12.71	13.52	0	0	67.26	29.48
Bigtooth aspen	0	0	0	12.78	0	21.13	3.11	0	62.90	0	54.89	0	12.12
Quaking aspen	0	31.76	0	144.35	84.49	156.64	94.28	106.61	8.68	0	111.15	32.46	72.53
Basswood	0	0	0	0	0	0	0	0	0	0	0	56.86	3.74
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	0	9.52	0	23.63	9.26	0	0	12.76	0	0	15.66	49.52	8.72
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	41.29	10.25	249.06	227.14	269.69	211.21	227.42	261.21	26.05	522.16	552.25	213.76
Total all species	0	346.92	328.05	888.46	966.67	1,354.95	1,603.90	1,202.80	1,428.96	1,810.99	2,880.58	3,587.58	1,242.80
Number of plots	6	6	6	6	10	10	9	6	7	2	3	5	76
Standard error	0	84.89	119.47	181.96	160.79	160.34	241.93	262.75	223.02	1,739.61	1,214.77	717.88	131.27
Average basal area	6	54	47	77	88	98	100	92	91	96	150	140	84

[1] See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 4.--*Estimated volume per acre yield for growing-stock trees for balsam fir-white spruce forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	22.64	12.83	9.63	3.90	24.61	34.11	5.78	8.02	444.59	0	0	21.71	20.17
Red pine	0	0	2.96	4.07	3.60	11.77	0	0	0	0	97.48	0	5.04
Jack pine	7.25	0	0	0	0	0	0	0	0	0	0	0	.52
White spruce	0	19.53	72.71	43.61	32.41	89.24	26.26	76.29	0	115.19	0	24.96	45.02
Black spruce	0	7.21	24.53	38.92	15.66	42.75	118.61	0	0	60.29	0	20.68	25.82
Balsam fir	60.01	128.97	177.53	271.83	402.21	429.45	503.89	301.30	90.88	274.78	84.13	141.64	295.29
Hemlock	2.75	1.39	20.98	10.68	15.26	9.43	80.64	0	0	52.60	34.29	53.23	15.05
Tamarack	1.95	2.36	2.59	2.80	10.27	9.07	0	13.14	0	0	0	48.32	7.13
Northern white-cedar	2.70	34.69	39.50	37.67	64.60	56.72	162.11	169.64	0	550.08	112.57	55.66	58.18
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	97.29	206.96	350.42	413.48	568.62	682.54	897.29	568.39	535.47	1,052.94	328.47	366.18	472.22
HARDWOODS													
White oak	0	0	0	2.96	0	0	0	0	0	0	0	0	.42
Select red oak	0	2.28	0	0	2.91	0	0	0	0	0	0	0	1.09
Other red oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Hickory	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow birch	2.55	1.95	5.27	25.19	4.34	12.43	37.07	30.59	0	37.25	49.56	55.70	12.19
Hard maple	3.42	7.18	8.58	1.13	9.34	13.85	0	10.62	0	0	0	0	7.44
Soft maple	3.52	3.62	24.33	24.91	43.34	31.77	52.61	21.35	74.11	0	19.85	0	27.30
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	6.63	25.45	1.99	16.39	13.19	29.08	39.47	54.38	0	120.14	0	8.37	18.42
Balsam poplar	0	2.09	6.44	12.19	4.80	0	0	0	0	0	0	0	4.02
Cottonwood	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper birch	13.68	35.86	23.85	46.43	46.48	66.58	56.55	101.60	0	31.64	44.91	6.09	44.02
Bigtooth aspen	0	0	0	5.51	6.29	9.45	0	0	0	0	0	0	4.16
Quaking aspen	39.36	6.53	67.93	88.64	81.52	105.52	36.21	82.34	657.32	0	130.17	22.21	72.26
Basswood	0	0	1.08	5.97	.72	7.78	0	0	0	0	0	0	2.49
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	3.25	7.51	0	11.80	11.17	11.39	0	0	0	0	0	3.94	7.98
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	72.43	92.48	139.47	241.13	224.11	287.85	221.91	300.88	731.43	189.04	244.49	96.30	201.77
Total all species	169.72	299.44	489.89	654.61	792.73	970.39	1,119.20	869.27	1,266.90	1,241.98	572.96	462.48	673.99
Number of plots	19	31	29	37	74	45	9	6	1	2	3	7	263
Standard error	46.35	36.17	69.71	52.61	47.15	73.33	143.15	114.07	R	57.27	287.53	126.84	27.95
Average basal area	18	42	65	76	89	98	117	86	71	105	65	49	75

[1] See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 5.--*Estimated volume per acre yield for growing-stock trees for black spruce forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	0	11.47	3.60	5.79	0	18.25	132.67	0	0	0	13.91	0	16.27
Red pine	0	0	29.00	0	12.22	32.61	110.54	0	0	0	0	0	20.19
Jack pine	0	0	0	0	0	17.17	0	23.61	0	0	0	0	3.59
White spruce	0	0	0	0	4.64	0	23.83	0	0	0	37.67	0	4.06
Black spruce	0	0	96.11	93.22	82.48	270.55	401.96	253.12	210.41	45.38	336.39	168.07	152.89
Balsam fir	0	9.95	3.87	6.23	15.11	15.72	43.42	47.09	0	0	30.92	183.98	19.64
Hemlock	0	0	0	0	0	20.55	0	0	0	0	9.74	0	3.75
Tamarack	0	77.79	32.65	23.30	39.73	31.09	29.64	0	0	0	0	37.69	30.46
Northern white-cedar	0	0	8.61	0	1.62	8.63	6.25	0	0	0	49.06	0	4.71
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	99.21	173.84	128.54	155.79	414.57	748.32	323.82	210.41	45.38	477.68	389.73	255.56
HARDWOODS													
White oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Select red oak	0	0	0	0	0	10.49	0	0	0	0	0	0	1.77
Other red oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Hickory	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow birch	0	0	0	0	0	0	10.64	0	0	0	26.06	0	1.62
Hard maple	0	0	0	0	0	0	12.65	0	0	0	0	0	1.00
Soft maple	0	25.62	0	0	0	3.56	16.21	0	0	0	0	0	3.15
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	0	0	0	0	0	0	0	0	0	0	0	0	0
Balsam poplar	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper birch	0	12.71	6.58	10.89	19.40	4.34	15.85	0	0	0	0	0	10.23
Bigtooth aspen	0	39.80	14.57	0	0	0	0	0	0	0	0	0	3.56
Quaking aspen	14.66	41.08	0	28.80	55.44	44.17	31.97	19.55	0	0	0	88.11	34.82
Basswood	0	0	0	0	0	0	0	0	0	0	0	0	0
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	14.66	119.21	21.15	39.69	74.84	62.56	87.32	19.55	0	0	26.06	88.11	56.14
Total all species	14.66	218.43	194.99	168.23	230.63	477.13	835.63	343.37	210.41	45.38	503.74	477.85	311.70
Number of plots	3	5	11	23	23	17	8	3	1	1	3	3	101
Standard error	14.66	145.86	63.44	43.71	49.11	93.99	164.49	314.50	R	R	253.26	107.91	34.53
Average basal area	4	31	36	43	50	77	73	74	49	60	94	58	53

[1] See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 6.--*Estimated volume per acre yield for growing-stock trees for northern white-cedar forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	0	0	4.63	20.85	0	4.66	14.23	7.26	23.74	0	13.50	20.69	11.01
Red pine	0	0	0	8.70	0	0	0	0	0	0	0	0	.57
Jack pine	0	0	0	0	0	0	0	0	0	0	0	0	0
White spruce	0	0	5.09	19.89	18.90	19.67	6.55	9.56	7.84	0	0	0	9.69
Black spruce	0	17.16	5.91	13.10	30.35	25.57	20.73	31.76	20.43	0	66.11	160.64	33.79
Balsam fir	0	11.69	23.87	126.83	107.83	63.54	82.77	120.03	86.41	0	173.38	306.10	101.18
Hemlock	0	0	0	16.51	17.30	4.24	22.85	0	46.23	0	32.83	142.48	26.25
Tamarack	0	11.81	4.36	0	78.39	60.41	35.44	7.00	70.57	46.48	29.49	0	37.70
Northern white-cedar	313.27	224.28	99.26	433.70	391.63	502.44	479.66	518.15	789.83	892.03	978.78	995.53	558.56
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	313.27	264.94	143.11	639.58	644.40	680.53	662.23	693.76	1,045.05	938.51	1,294.09	1,625.43	778.76
HARDWOODS													
White oak	0	0	0	0	0	0	4.40	0	0	0	0	0	.65
Select red oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Other red oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Hickory	0	0	0	0	6.21	0	0	0	0	0	0	0	.71
Yellow birch	0	0	0	0	27.04	11.72	5.05	0	25.77	0	6.91	13.83	10.70
Hard maple	0	0	0	0	0	0	0	5.37	0	0	0	6.63	1.02
Soft maple	0	0	0	12.61	9.53	4.31	11.77	5.24	15.30	19.60	30.05	28.60	11.50
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	0	0	0	1.36	14.06	29.22	26.88	31.85	47.75	56.32	19.19	27.50	24.90
Balsam poplar	0	0	0	0	0	4.25	4.53	0	0	0	0	0	1.26
Cottonwood	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper birch	63.29	95.12	11.48	23.91	9.80	50.93	36.94	73.29	29.70	0	39.65	65.01	38.48
Bigtooth aspen	0	0	0	0	0	0	0	0	0	0	0	0	0
Quaking aspen	0	29.35	0	63.96	16.53	56.66	14.78	7.89	0	17.32	19.16	0	19.57
Basswood	0	0	0	0	0	0	0	10.94	17.95	0	9.71	0	4.28
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	0	37.34	0	0	15.90	23.97	25.79	27.06	30.11	49.91	86.14	0	23.88
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	63.29	161.81	11.48	101.83	99.07	181.07	130.14	161.63	166.58	143.15	210.81	141.57	136.95
Total all species	376.56	426.75	154.59	741.42	743.46	861.60	792.37	855.39	1,211.63	1,081.66	1,504.90	1,767.00	915.71
Number of plots	1	4	10	8	14	17	18	12	18	4	7	9	122
Standard error	R	110.30	53.47	195.05	103.83	145.14	126.11	141.93	145.36	314.96	323.38	344.13	62.16
Average basal area	68	76	48	98	100	112	105	100	149	135	147	125	110

[1]See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 7.--*Estimated volume per acre yield for growing-stock trees for tamarack forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	1.75	9.09	7.14	10.61	10.02	27.13	0	22.36	55.98	137.33	0	0	12.75
Red pine	0	0	0	0	0	4.64	8.82	0	0	0	0	0	1.38
Jack pine	0	2.52	0	6.73	0	0	0	0	0	0	0	0	.94
White spruce	0	0	0	0	0	3.97	22.79	8.82	0	0	0	0	2.84
Black spruce	1.71	26.91	0	28.63	43.31	65.41	52.58	0	37.76	119.76	0	0	30.38
Balsam fir	0	9.28	0	11.85	12.78	47.29	24.56	64.87	0	0	0	0	17.47
Hemlock	0	3.09	0	0	0	0	0	9.85	0	0	0	0	1.09
Tamarack	30.49	73.52	71.41	225.82	291.74	371.94	395.75	590.14	473.09	204.97	0	0	222.58
Northern white-cedar	0	0	0	22.85	8.72	45.79	5.83	7.53	0	0	0	0	11.09
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	33.95	124.41	78.55	306.49	366.57	566.17	510.33	703.56	566.83	462.07	0	0	300.53
HARDWOODS													
White oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Select red oak	0	0	0	0	3.75	0	0	0	0	0	0	0	.64
Other red oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Hickory	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow birch	0	0	0	0	4.16	0	0	6.19	0	0	0	0	1.07
Hard maple	0	0	0	0	0	0	0	0	0	0	0	0	0
Soft maple	0	0	7.91	0	7.37	0	7.96	0	0	0	0	0	2.47
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	0	0	0	0	0	0	0	0	0	0	0	0	0
Balsam poplar	0	0	0	0	0	4.18	0	0	0	0	0	0	.64
Cottonwood	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper birch	2.95	0	25.67	6.89	30.47	17.42	14.53	10.32	0	63.26	0	0	13.22
Bigtooth aspen	0	0	0	0	0	0	0	0	0	0	0	0	0
Quaking aspen	2.98	0	36.98	0	0	16.44	0	7.76	0	0	0	0	6.33
Basswood	0	0	0	0	0	0	0	0	0	0	0	0	0
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	0	0	0	0	0	11.45	0	13.11	27.74	0	0	0	3.02
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5.93	0	70.56	6.89	45.76	49.48	22.48	37.38	27.74	63.26	0	0	27.39
Total all species	39.88	124.41	149.12	313.38	412.33	615.64	532.82	740.93	594.57	525.33	0	0	327.92
Number of plots	20	18	8	8	18	16	8	6	2	1	0	0	105
Standard error	12.77	32.01	62.10	100.29	87.25	128.50	128.99	186.87	108.53	R	0	0	37.19
Average basal area	7	25	37	43	50	64	50	62	59	90	0	0	39

[1]See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 8.--*Estimated volume per acre yield for growing-stock trees for oak-hickory forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	.85	2.81	4.99	9.85	16.09	9.61	27.47	21.67	9.11	4.50	11.76	31.07	12.02
Red pine	.92	4.56	0	5.69	8.43	5.72	13.74	8.96	3.18	.92	0	0	5.26
Jack pine	9.68	18.89	8.52	25.88	22.40	25.56	19.53	7.44	7.75	3.05	.70	0	15.48
White spruce	0	0	0	0	0	0	0	0	0	0	0	0	0
Black spruce	0	0	0	0	0	0	0	0	0	0	0	0	0
Balsam fir	0	0	0	0	0	0	0	0	0	0	0	0	0
Hemlock	0	0	0	0	0	.73	0	0	0	0	0	0	.09
Tamarack	0	.90	0	0	1.00	1.20	0	0	0	0	0	0	.34
Northern white-cedar	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	11.46	27.17	13.51	41.42	47.93	42.82	60.75	38.07	20.04	8.47	12.46	31.07	33.18
HARDWOODS													
White oak	14.66	27.84	72.02	45.69	75.84	103.65	145.56	183.71	189.21	241.24	297.83	258.88	116.43
Select red oak	21.33	38.85	96.92	190.41	260.00	269.91	325.71	357.14	399.43	453.77	343.91	519.61	251.62
Other red oak	33.11	26.00	50.61	126.43	135.41	166.05	172.56	135.33	185.22	85.92	130.99	113.19	119.36
Hickory	6.44	7.30	39.94	28.67	30.50	31.30	33.99	40.87	52.06	56.96	42.81	35.18	31.86
Yellow birch	0	0	0	0	0	.94	0	.51	0	0	0	1.78	.20
Hard maple	0	0	0	3.41	10.86	12.23	19.20	14.00	15.30	20.41	7.89	16.79	9.47
Soft maple	4.30	1.68	21.20	15.45	29.42	21.06	57.24	20.59	11.16	30.29	15.37	47.45	22.01
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	.53	.77	2.80	6.53	10.42	5.18	13.50	10.24	9.11	13.00	3.95	12.91	7.24
Balsam poplar	0	0	0	.39	0	.50	0	.66	0	0	0	0	.17
Cottonwood	0	1.79	0	.43	1.53	2.51	0	3.36	2.77	0	0	0	1.14
Paper birch	6.00	6.79	34.98	35.22	54.40	39.67	29.91	13.94	17.14	24.74	9.24	4.90	27.22
Bigtooth aspen	5.52	13.91	34.84	59.81	64.06	47.20	63.29	51.13	29.64	42.29	36.33	31.11	43.48
Quaking aspen	3.04	10.91	20.45	72.34	60.77	26.58	26.74	19.34	19.34	20.72	10.01	11.63	31.21
Basswood	1.30	2.33	11.90	12.99	16.65	10.86	6.40	20.50	14.74	22.41	18.63	40.34	13.13
Butternut	1.37	0	5.29	2.08	2.61	2.88	.49	3.54	2.98	7.03	.75	4.01	2.49
Black walnut	2.90	5.98	14.71	16.70	16.19	14.06	31.01	27.96	30.19	34.29	39.24	62.15	20.92
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	100.49	144.15	405.66	616.55	768.67	754.63	925.60	902.81	978.28	1,053.07	956.95	1,159.90	697.95
Total all species	111.95	171.32	419.17	657.97	816.60	797.45	986.35	940.87	998.33	1,061.54	969.41	1,190.97	731.13
Number of plots	136	76	64	176	185	152	115	102	88	70	81	37	1,282
Standard error	13.38	17.16	50.15	33.15	35.29	37.75	50.35	57.05	63.19	75.95	70.69	130.30	16.14
Average basal area	28	50	68	79	85	82	88	85	84	90	83	97	76

[1] See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 9.--*Estimated volume per acre yield for growing-stock trees for elm-ash-cottonwood forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	0	4.31	14.89	21.94	3.44	17.18	12.88	36.82	24.64	4.03	25.79	0	13.58
Red pine	.78	1.72	3.42	1.33	0	0	0	0	0	0	0	0	.69
Jack pine	0	0	4.76	.84	1.63	2.33	0	0	0	0	0	0	1.02
White spruce	.86	3.98	2.32	4.93	6.78	3.73	6.47	7.85	19.84	4.82	0	34.91	5.82
Black spruce	0	1.32	0	1.36	2.00	2.37	0	5.42	0	0	13.73	0	1.83
Balsam fir	4.16	9.93	15.62	23.55	22.95	38.08	36.69	28.90	38.10	33.79	24.49	68.21	25.51
Hemlock	.72	2.94	0	1.94	9.63	16.63	27.71	31.57	11.75	5.90	33.75	20.06	12.15
Tamarack	7.01	5.69	2.56	4.08	6.09	10.28	11.15	13.91	7.89	2.07	0	0	6.79
Northern white-cedar	2.06	8.00	3.27	22.62	31.63	75.66	51.21	84.14	20.95	71.25	51.25	180.70	39.64
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	15.60	37.89	46.83	82.59	84.16	166.27	146.11	208.61	123.17	121.86	149.01	303.88	107.04
HARDWOODS													
White oak	2.18	0	3.32	5.41	2.60	18.49	16.07	26.18	41.73	30.51	14.41	4.60	11.61
Select red oak	1.04	0	2.23	6.81	15.95	10.83	16.16	7.95	12.56	15.82	2.23	0	8.21
Other red oak	0	0	1.62	0	4.23	1.53	0	4.11	2.11	0	0	0	1.22
Hickory	.98	0	0	0	1.48	0	2.38	0	0	0	0	0	.57
Yellow birch	1.17	0	6.39	7.18	20.24	19.22	17.19	14.19	25.84	15.83	26.18	76.93	14.49
Hard maple	1.17	1.52	7.71	.87	17.06	10.56	4.91	30.64	27.76	20.82	6.04	0	9.45
Soft maple	11.49	23.30	51.20	97.21	162.02	170.21	199.31	151.87	226.52	150.13	393.16	74.69	132.54
Beech	0	0	0	3.71	0	.96	0	2.38	0	0	0	0	.74
Ash	31.93	43.34	91.98	124.32	170.60	242.40	263.09	231.31	404.04	501.40	255.65	434.18	190.13
Balsam poplar	0	1.49	2.20	0	6.31	16.47	4.09	4.44	0	3.96	0	0	4.17
Cottonwood	1.16	4.52	0	23.47	8.53	13.31	3.46	15.33	0	45.85	38.16	0	10.97
Paper birch	2.68	8.09	27.73	47.50	43.48	33.14	23.03	32.83	41.75	8.09	15.91	2.55	26.86
Bigtooth aspen	0	5.60	5.97	14.20	5.32	9.05	11.09	0	6.82	4.22	0	0	6.36
Quaking aspen	7.91	19.37	32.95	69.95	75.38	36.79	38.38	26.34	47.25	5.25	2.10	12.13	36.95
Basswood	2.39	0	1.54	17.44	24.33	14.98	35.25	21.67	29.52	69.70	15.54	73.13	19.44
Butternut	0	0	0	0	0	0	1.10	0	0	0	0	0	.13
Black walnut	28.77	27.47	100.39	95.02	152.99	246.73	213.41	273.11	348.45	422.52	312.12	120.82	170.52
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	92.88	134.69	335.21	513.10	710.51	844.66	848.94	842.34	1,214.36	1,294.11	1,081.49	799.03	644.34
Total all species	108.48	172.58	382.05	595.69	794.67	1,010.92	995.05	1,050.95	1,337.53	1,415.96	1,230.51	1,102.91	751.38
Number of plots	69	45	51	71	68	78	69	37	30	20	28	14	580
Standard error	16.04	27.06	42.59	46.77	73.56	68.90	70.49	106.98	101.65	166.97	128.68	122.14	26.57
Average basal area	18	36	55	67	76	87	87	88	106	109	92	106	71

[1]See page21 for definition of forest types and pages 21 and 22 for species group.

Table 10.--*Estimated volume per acre yield for growing-stock trees for maple-beech-birch forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	16.27	9.85	28.35	13.97	20.71	19.72	42.11	39.94	19.36	29.22	75.90	82.22	30.26
Red pine	1.25	.99	1.23	2.06	2.13	2.63	13.74	0	2.85	3.26	12.39	4.43	3.73
Jack pine	.45	0	.57	.27	0	.91	.87	0	0	0	.63	0	.34
White spruce	0	.85	.84	2.25	4.31	4.06	.75	2.03	3.48	1.04	2.02	5.56	2.67
Black spruce	0	0	0	.69	.42	1.27	.46	0	0	1.81	1.24	0	.55
Balsam fir	4.11	12.59	14.24	17.38	25.40	21.48	18.10	20.75	22.63	14.87	34.68	21.56	19.94
Hemlock	9.43	9.69	8.10	8.37	29.17	29.77	29.61	64.29	62.62	160.78	246.76	582.55	84.30
Tamarack	0	0	0	.25	0	1.95	1.91	0	0	0	0	1.50	.59
Northern white-cedar	7.60	2.01	1.06	2.13	8.30	10.56	3.65	8.82	30.61	27.55	44.03	59.89	14.42
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	39.12	35.97	54.40	47.37	90.44	92.35	111.20	135.84	141.56	238.53	417.64	757.71	156.80
HARDWOODS													
White oak	1.59	1.20	4.61	11.41	15.17	9.20	22.32	32.26	21.81	37.10	8.60	22.09	15.10
Select red oak	11.28	18.76	30.17	41.95	46.89	60.52	69.10	74.14	69.64	104.19	50.80	57.70	52.84
Other red oak	4.72	1.34	3.91	4.33	3.51	.91	10.59	3.18	7.38	2.97	5.83	0	3.88
Hickory	5.75	1.02	3.01	14.61	6.18	6.27	8.68	13.88	12.51	9.40	21.65	6.76	8.93
Yellow birch	1.77	2.01	10.96	15.99	31.76	46.09	32.61	43.96	80.51	89.39	85.71	183.42	47.42
Hard maple	9.94	31.75	44.62	114.30	199.69	237.72	299.61	262.98	335.07	372.34	459.40	505.63	231.16
Soft maple	25.35	31.44	62.84	68.16	89.85	117.28	124.84	109.63	54.18	89.30	53.34	67.28	81.95
Beech	1.67	0	0	1.06	2.17	5.89	14.48	0	7.19	13.65	41.30	26.75	7.96
Ash	3.64	16.29	24.50	41.90	59.89	81.94	49.85	70.04	37.14	81.89	30.41	49.40	50.77
Balsam poplar	0	0	4.21	0	.49	4.57	.51	0	1.03	0	0	0	1.12
Cottonwood	0	0	0	0	0	1.90	1.83	1.17	3.75	.93	0	0	.78
Paper birch	11.54	30.85	49.63	46.25	68.28	70.93	50.22	28.45	41.58	24.37	18.08	29.07	46.25
Bigtooth aspen	2.63	10.96	13.21	19.26	17.78	15.66	31.42	7.63	6.45	18.18	5.78	3.80	14.44
Quaking aspen	29.54	60.86	64.47	98.03	81.30	67.15	41.02	24.24	25.16	.82	37.79	9.82	54.40
Basswood	14.76	37.30	58.92	158.72	155.63	183.92	106.63	138.70	127.89	139.46	84.55	132.23	127.17
Butternut	1.77	.71	0	2.66	3.07	1.79	4.34	5.27	5.90	3.80	6.91	2.08	3.05
Black walnut	36.33	26.17	66.30	94.43	92.55	141.44	141.56	187.37	155.62	150.58	176.14	164.35	118.97
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	162.27	270.65	441.36	733.04	874.21	1,053.20	1,009.59	1,002.88	992.82	1,138.37	1,086.30	1,260.38	866.20
Total all species	201.39	306.62	495.75	780.40	964.65	1,145.55	1,120.79	1,138.72	1,134.37	1,376.90	1,503.94	2,018.09	1,023.01
Number of plots	79	79	90	185	254	222	131	105	83	73	83	102	1,486
Standard error	24.87	24.25	33.91	31.40	28.24	34.21	46.36	54.55	69.91	90.40	78.65	90.33	17.78
Average basal area	31	58	72	88	97	99	94	95	92	99	104	118	90

[1]See page21 for definition of forest types and pages 21 and 22 for species group.

Table 11.--*Estimated volume per acre yield for growing-stock trees for aspen forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	4.19	5.45	7.83	7.38	22.50	42.24	100.61	145.61	52.36	155.30	0	50.33	12.11
Red pine	5.65	6.00	6.17	9.45	21.50	21.20	60.19	0	0	42.90	0	0	10.62
Jack pine	5.35	7.09	14.55	13.41	14.04	0	0	0	0	0	0	0	10.30
White spruce	3.20	2.23	3.15	3.65	6.41	4.78	15.46	24.29	0	0	0	0	3.94
Black spruce	.62	1.54	.42	1.85	4.79	1.99	5.67	25.57	0	0	0	16.78	1.98
Balsam fir	8.40	6.62	8.84	20.77	22.80	59.29	54.37	0	0	73.36	0	161.78	16.92
Hemlock	.65	.81	.69	.19	.77	0	6.40	0	0	0	0	0	.60
Tamarack	3.59	3.02	1.19	3.33	5.64	.99	0	26.14	12.90	0	0	0	3.36
Northern white-cedar	1.67	2.02	.92	3.23	3.80	6.64	25.57	0	0	0	0	0	2.84
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	33.32	34.79	43.75	63.26	102.24	137.12	268.28	221.60	65.26	271.56	0	228.89	62.67
HARDWOODS													
White oak	1.15	4.09	3.90	8.93	11.07	5.26	18.91	0	19.87	0	0	0	6.18
Select red oak	3.25	6.20	7.23	30.12	35.61	48.75	14.11	14.48	499.38	0	0	0	19.97
Other red oak	2.06	.71	5.42	7.22	9.25	2.92	14.28	0	0	0	0	0	5.11
Hickory	1.11	.19	0	1.00	.21	0	0	32.95	0	0	0	0	.67
Yellow birch	.42	.57	.87	.64	2.21	2.11	0	0	0	0	0	0	.92
Hard maple	2.61	2.10	2.92	5.14	7.52	7.88	5.53	37.46	0	0	0	0	4.42
Soft maple	5.13	8.21	9.00	22.37	32.63	43.86	32.47	50.73	162.62	0	0	56.24	17.85
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	4.14	5.04	3.17	6.76	13.88	8.02	28.27	51.93	26.18	0	0	0	7.05
Balsam poplar	1.57	2.41	3.26	4.62	10.53	20.30	8.42	77.32	0	0	0	0	5.28
Cottonwood	0	0	0	.99	3.13	0	0	0	0	0	0	0	.79
Paper birch	13.47	23.38	29.08	59.96	78.66	104.05	120.68	29.29	0	31.16	0	84.09	45.81
Bigtooth aspen	6.08	15.31	42.69	124.81	208.55	178.08	143.22	258.01	355.93	93.31	0	0	88.92
Quaking aspen	76.26	143.50	259.55	461.67	510.30	505.72	475.34	369.93	235.01	70.94	0	202.21	314.46
Basswood	2.03	2.04	2.17	4.95	8.47	10.72	4.02	0	0	0	0	18.23	4.31
Butternut	0	0	.18	.53	.55	2.37	0	0	0	0	0	0	.36
Black walnut	5.46	5.81	6.03	9.60	15.42	27.07	22.43	48.61	21.59	0	0	0	9.55
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	124.73	219.55	375.46	749.30	947.98	967.12	887.67	970.72	1,320.58	195.41	0	360.78	531.65
Total all species	158.04	254.34	419.21	812.56	1,050.23	1,104.24	1,155.95	1,192.32	1,385.83	466.98	0	589.67	594.32
Number of plots	326	239	224	451	260	61	17	5	3	2	0	4	1,592
Standard error	9.35	13.60	21.47	21.53	33.48	77.10	161.86	230.41	653.93	466.98	0	352.77	13.24
Average basal area	25	45	55	74	88	85	88	92	90	40	0	53	60

[1] See page 21 for forest types and pages 21 and 22 for species group.

Table 12.--*Estimated volume per acre yield for growing-stock trees for paper birch forest type in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	2.21	1.91	2.92	1.93	25.58	31.57	74.02	83.30	101.00	0	0	0	16.02
Red pine	0	0	0	0	15.58	60.17	36.35	0	60.25	0	0	0	14.14
Jack pine	0	0	2.26	14.02	6.07	9.10	0	0	0	0	0	0	6.17
White spruce	0	0	0	2.18	8.01	2.09	20.55	295.11	0	0	0	0	4.67
Black spruce	0	0	4.04	0	2.19	3.64	0	0	0	0	0	0	1.56
Balsam fir	0	4.21	19.79	24.78	37.98	78.84	124.63	0	0	0	77.02	0	33.59
Hemlock	0	0	10.47	1.27	2.86	10.31	17.19	0	0	0	0	0	4.46
Tamarack	0	3.91	5.22	0	4.31	6.97	7.37	0	0	0	0	0	3.35
Northern white-cedar	0	0	21.63	3.94	0	2.05	154.88	0	0	0	64.64	0	10.26
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2.21	10.03	66.33	48.12	102.60	204.74	435.00	378.41	161.25	0	141.66	0	94.23
HARDWOODS													
White oak	0	12.41	10.57	6.20	3.17	1.99	18.33	0	67.29	0	70.51	0	6.95
Select red oak	3.60	0	33.59	62.23	29.86	98.94	56.09	0	262.09	0	0	303.60	46.51
Other red oak	0	0	3.67	6.11	2.00	7.38	0	0	0	0	0	0	3.38
Hickory	0	4.36	1.56	3.68	0	0	0	0	0	0	0	0	1.49
Yellow birch	0	1.13	5.89	0	4.49	4.09	4.42	0	0	0	0	0	2.69
Hard maple	0	0	1.99	8.96	32.11	22.96	13.27	0	119.25	0	0	0	14.97
Soft maple	5.93	7.53	11.02	35.92	49.48	59.03	35.83	0	69.41	0	0	0	32.98
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	0	2.80	5.92	7.26	11.63	11.51	28.38	0	0	0	115.79	0	8.61
Balsam poplar	0	0	6.22	0	0	3.61	81.77	0	0	0	271.57	0	5.59
Cottonwood	0	0	0	1.67	0	0	24.32	0	0	0	0	0	1.30
Paper birch	47.81	87.18	225.67	413.79	485.79	617.83	661.20	126.52	564.07	0	144.32	120.95	371.08
Bigtooth aspen	0	4.10	14.32	18.10	49.70	62.05	48.84	0	0	0	0	0	28.50
Quaking aspen	7.53	23.46	21.24	96.92	129.36	144.97	124.23	216.70	105.60	0	0	100.15	85.69
Basswood	0	0	4.87	6.75	10.71	1.64	15.86	0	0	0	152.74	0	6.16
Butternut	0	0	1.85	0	0	0	0	0	0	0	0	0	.25
Black walnut	0	0	13.53	17.15	4.07	1.82	70.17	0	0	0	0	0	9.60
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	64.88	142.96	361.92	684.73	812.38	1,037.83	1,182.70	343.21	1,187.71	0	754.92	524.70	625.76
Total all species	67.09	152.98	428.25	732.86	914.98	1,242.57	1,617.69	721.62	1,348.96	0	896.58	524.70	719.99
Number of plots	24	24	32	54	55	33	9	1	3	0	1	1	237
Standard error	21.72	38.80	69.44	51.89	49.66	102.91	212.58	R	767.63	0	R	R	37.62
Average basal area	19	33	60	76	83	96	114	52	94	0	64	49	70

[1] See page 21 for forest types and pages 21 and 22 for species group.

Table 13.--*Estimated volume per acre yield from growing-stock trees for the aspen type on sites having site indexes 0 to 50 in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	13.70	0	8.99	5.90	35.75	145.98	0	0	0	0	0	0	14.44
Red pine	1.83	1.77	0	7.70	0	10.95	0	0	0	0	0	0	3.13
Jack pine	4.73	1.67	14.47	17.19	0	0	0	0	0	0	0	0	7.94
White spruce	11.52	0	12.29	14.22	24.56	0	28.80	0	0	0	0	0	11.07
Black spruce	0	4.22	2.36	3.18	64.28	0	0	127.87	0	0	0	0	8.52
Balsam fir	2.39	5.85	10.05	8.20	53.37	60.12	122.06	0	0	0	0	0	14.53
Hemlock	.68	0	4.74	0	3.25	0	36.28	0	0	0	0	0	1.88
Tamarack	0	4.24	0	2.53	4.27	0	0	130.69	0	0	0	0	2.74
Northern white-cedar	0	2.45	2.53	1.47	11.01	0	106.53	0	0	0	0	0	4.36
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	34.84	20.21	55.42	60.39	196.48	217.05	293.66	258.56	0	0	0	0	68.62
HARDWOODS													
White oak	0	6.65	0	3.31	0	0	20.63	0	0	0	0	0	2.57
Select red oak	0	4.56	0	0	0	0	0	0	0	0	0	0	.90
Other red oak	0	0	0	0	14.68	0	80.90	0	0	0	0	0	2.95
Hickory	0	0	0	2.96	0	0	0	0	0	0	0	0	.75
Yellow birch	1.04	0	0	0	0	8.48	0	0	0	0	0	0	.56
Hard maple	5.15	0	9.56	4.36	6.88	0	0	0	0	0	0	0	4.40
Soft maple	1.51	1.97	2.78	.48	12.72	61.37	53.19	0	0	0	0	0	5.59
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	4.26	5.43	0	4.37	22.88	20.51	64.09	0	0	0	0	0	7.30
Balsam poplar	0	11.87	7.86	3.44	5.15	0	0	0	0	0	0	0	4.79
Cottonwood	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper birch	1.99	8.29	13.56	42.56	108.30	264.65	50.09	0	0	0	0	0	34.40
Bigtooth aspen	0	16.78	0	28.78	57.85	0	71.39	0	0	0	0	0	17.13
Quaking aspen	51.03	85.17	133.16	328.69	346.45	218.86	153.04	131.59	0	0	0	0	173.85
Basswood	4.72	0	4.76	4.73	0	0	0	0	0	0	0	0	3.09
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	3.24	10.66	3.22	10.46	20.01	0	0	0	0	0	0	0	7.80
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	72.94	151.40	174.90	434.14	594.91	573.88	493.32	131.59	0	0	0	0	266.08
Total all species	107.79	171.60	230.32	494.54	791.39	790.93	786.98	390.15	0	0	0	0	334.70
Number of plots	38	29	21	37	13	5	3	1	0	0	0	0	147
Standard error	25.85	37.89	57.29	62.43	145.97	300.34	168.71	R	0	0	0	0	32.19
Average basal area	18	30	35	50	71	65	84	41	0	0	0	0	39

[1] See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 14.--*Estimated volume per acre yield from growing-stock trees for the aspen type on sites having site indexes 51 to 60 in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	4.04	3.45	5.26	6.35	17.49	15.66	0	0	52.98	0	0	0	7.06
Red pine	4.18	8.04	3.09	10.27	37.50	0	0	0	0	0	0	0	10.26
Jack pine	3.71	15.94	14.06	20.12	22.56	0	0	0	0	0	0	0	12.88
White spruce	.51	4.58	5.01	2.09	3.93	0	13.97	121.44	0	0	0	0	3.17
Black spruce	.64	0	0	4.51	1.30	0	11.95	0	0	0	0	0	1.43
Balsam fir	8.46	6.49	4.15	19.88	31.78	23.97	46.19	0	0	0	0	237.17	14.94
Hemlock	0	0	1.10	0	0	0	0	0	0	0	0	0	.16
Tamarack	6.90	5.24	3.29	17.37	5.71	0	0	0	0	0	0	0	7.52
Northern white-cedar	0	.68	3.12	9.08	2.19	0	0	0	0	0	0	0	2.67
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28.45	44.41	39.09	89.67	122.46	39.63	72.11	121.44	52.98	0	0	237.17	60.10
HARDWOODS													
White oak	1.54	2.91	.90	2.69	8.16	4.66	0	0	0	0	0	0	2.93
Select red oak	5.24	6.47	1.30	16.64	10.41	23.78	36.60	0	341.03	0	0	0	10.12
Other red oak	1.10	.99	6.37	7.75	2.98	0	0	0	0	0	0	0	3.36
Hickory	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow birch	0	0	1.23	0	0	0	0	0	0	0	0	0	.18
Hard maple	2.20	4.50	0	.63	4.55	0	0	187.28	0	0	0	0	2.69
Soft maple	5.40	7.95	2.28	18.66	19.37	54.31	11.65	253.64	487.86	0	0	0	14.41
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	7.02	8.24	2.41	.62	7.28	7.96	0	259.67	78.55	0	0	0	6.20
Balsam poplar	.77	0	2.91	10.61	14.26	18.56	0	0	0	0	0	0	5.58
Cottonwood	0	0	0	1.82	8.99	0	0	0	0	0	0	0	1.63
Paper birch	10.46	24.52	9.97	38.14	36.22	41.34	0	0	0	0	0	272.40	23.75
Bigtooth aspen	2.62	10.28	11.27	68.22	70.24	24.96	346.07	0	0	0	0	0	33.75
Quaking aspen	57.10	104.08	118.36	317.30	378.08	377.72	514.32	769.68	630.06	0	0	0	195.33
Basswood	3.36	.90	2.04	.98	9.61	12.77	0	0	0	0	0	0	3.51
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	3.42	3.73	2.81	9.85	3.88	45.64	38.91	121.75	64.77	0	0	0	7.67
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	100.25	174.57	161.86	493.90	574.02	611.71	947.55	1,592.02	1,602.26	0	0	272.40	311.11
Total all species	128.70	218.99	200.95	583.57	696.48	651.34	1,019.66	1,713.46	1,655.24	0	0	509.57	371.21
Number of plots	94	55	49	66	47	15	5	1	1	0	0	1	334
Standard error	15.87	22.94	18.69	38.54	46.08	67.80	284.83	R	R	0	0	R	19.21
Average basal area	20	39	41	62	71	61	70	124	128	0	0	67	45

[1] See page21 for definition of forest types and pages 21 and 22 for species group.

Table 15.--*Estimated volume per acre yield from growing-stock trees for the aspen type on sites having site indexes 61 to 70 in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	1.99	11.95	8.54	13.87	16.91	44.38	267.91	728.03	104.09	0	0	0	16.19
Red pine	7.31	1.99	7.79	10.17	21.05	25.33	42.57	0	0	0	0	0	11.41
Jack pine	5.13	5.22	28.54	19.48	16.04	0	0	0	0	0	0	0	13.22
White spruce	3.22	1.50	2.74	1.73	7.06	10.80	0	0	0	0	0	0	3.68
Black spruce	1.22	0	.90	2.69	3.13	4.49	9.17	0	0	0	0	0	2.05
Balsam fir	8.16	6.39	9.79	21.46	22.34	107.37	12.06	0	0	0	0	0	19.87
Hemlock	.95	.81	0	0	1.56	0	0	0	0	0	0	0	.64
Tamarack	4.50	2.87	0	1.34	6.66	2.25	0	0	38.70	0	0	0	3.31
Northern white-cedar	1.04	.83	0	1.67	1.22	14.99	0	0	0	0	0	0	1.85
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	33.53	31.55	58.31	72.42	95.97	209.61	331.71	728.03	142.79	0	0	0	72.22
HARDWOODS													
White oak	.96	1.70	3.71	7.76	5.24	4.88	64.91	0	0	0	0	0	4.75
Select red oak	2.05	7.26	7.48	21.65	29.38	36.10	14.22	72.41	0	0	0	0	16.14
Other red oak	3.00	.94	5.84	8.67	10.58	2.55	0	0	0	0	0	0	6.02
Hickory	2.44	0	0	0	0	0	0	0	0	0	0	0	.56
Yellow birch	0	.92	0	.50	1.38	1.47	0	0	0	0	0	0	.61
Hard maple	2.40	1.96	3.52	4.43	3.80	13.52	0	0	0	0	0	0	3.85
Soft maple	2.01	12.41	0	17.08	29.08	32.99	68.04	0	0	0	0	0	14.87
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	3.10	4.84	1.67	2.36	13.21	7.14	39.17	0	0	0	0	0	5.49
Balsam poplar	.80	1.17	0	4.53	16.77	35.55	0	74.23	0	0	0	0	6.99
Cottonwood	0	0	0	.49	3.88	0	0	0	0	0	0	0	.91
Paper birch	15.71	18.59	25.17	44.64	79.88	103.53	28.29	82.31	0	0	0	0	42.67
Bigtooth aspen	7.16	10.66	42.93	81.06	159.42	111.12	0	0	0	0	0	0	67.35
Quaking aspen	77.06	158.90	224.50	412.34	511.98	649.86	417.54	73.01	0	0	0	0	314.08
Basswood	.96	5.51	0	1.51	7.90	12.33	0	0	0	0	0	0	3.60
Butternut	0	0	0	0	0	0	0	0	0	0	0	0	0
Black walnut	5.70	1.10	0	10.19	18.48	33.19	0	0	0	0	0	0	9.72
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	123.34	225.95	314.83	617.21	890.99	1,044.22	632.17	301.96	0	0	0	0	497.63
Total all species	156.87	257.50	373.14	689.63	986.96	1,253.83	963.87	1,029.98	142.79	0	0	0	569.85
Number of plots	116	65	50	137	101	27	4	1	1	1	0	0	503
Standard error	15.16	25.08	31.18	29.33	47.60	87.54	234.58	R	R	I	0	0	21.30
Average basal area	24	45	54	69	84	97	71	71	15	0	0	0	58

[1] See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 16.--*Estimated volume per acre yield from growing-stock trees for the aspen type on sites having site indexes 71 to 80 in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	5.07	5.24	4.89	5.05	32.28	37.57	127.75	0	0	310.61	0	67.11	13.29
Red pine	11.57	12.69	9.82	9.15	16.55	50.39	170.58	0	0	85.80	0	0	14.46
Jack pine	0	4.06	12.71	9.90	11.78	0	0	0	0	0	0	0	8.12
White spruce	2.69	1.32	.99	1.15	6.25	0	21.32	0	0	0	0	0	2.40
Black spruce	0	2.90	0	0	.44	0	0	0	0	0	0	22.38	.69
Balsam fir	15.43	5.27	6.77	20.93	17.03	5.26	55.79	0	0	146.72	0	136.64	15.96
Hemlock	1.68	2.22	0	.59	0	0	0	0	0	0	0	0	.73
Tamarack	0	1.12	1.59	.55	1.46	0	0	0	0	0	0	0	.87
Northern white-cedar	9.18	5.02	0	1.07	0	0	23.03	0	0	0	0	0	2.44
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	45.63	39.83	36.77	48.39	85.78	93.22	398.49	0	0	543.12	0	226.13	58.96
HARDWOODS													
White oak	2.60	6.36	2.56	10.32	15.75	0	0	0	59.60	0	0	0	8.13
Select red oak	4.31	7.02	13.58	35.84	49.37	82.81	0	0	1,157.11	0	0	0	29.69
Other red oak	.88	0	5.91	7.49	5.89	9.95	0	0	0	0	0	0	4.91
Hickory	1.70	.71	0	1.05	0	0	0	82.38	0	0	0	0	1.06
Yellow birch	0	0	0	0	2.72	4.27	0	0	0	0	0	0	.59
Hard maple	0	1.98	2.49	6.53	10.28	6.37	18.80	0	0	0	0	0	5.14
Soft maple	12.46	5.27	19.63	24.25	33.02	60.30	12.40	0	0	0	0	74.99	21.75
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	2.38	1.31	1.83	9.44	8.25	0	26.33	0	0	0	0	0	5.77
Balsam poplar	0	2.44	6.40	.30	0	0	28.62	156.19	0	0	0	0	2.60
Cottonwood	0	0	0	1.82	0	0	0	0	0	0	0	0	.63
Paper birch	16.04	35.44	40.88	72.53	101.37	146.22	357.61	32.07	0	62.33	0	21.32	65.12
Bigtooth aspen	9.30	15.87	46.34	150.36	253.34	592.54	98.04	645.03	1,067.79	186.63	0	0	129.94
Quaking aspen	110.76	175.75	325.52	565.89	632.56	301.54	675.97	437.69	74.96	141.87	0	269.61	417.61
Basswood	1.19	1.23	3.00	11.55	10.39	11.78	13.68	0	0	0	0	24.31	7.25
Butternut	0	0	0	.86	0	0	0	0	0	0	0	0	.30
Black walnut	6.09	9.48	1.64	11.04	9.52	0	37.35	60.66	0	0	0	0	8.62
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	167.72	262.86	469.75	909.28	1,132.46	1,215.77	1,268.80	1,414.01	2,359.47	390.83	0	390.24	709.11
Total all species	213.35	302.69	506.53	957.67	1,218.24	1,308.98	1,667.29	1,414.01	2,359.47	933.95	0	616.37	768.07
Number of plots	46	64	66	143	72	11	5	2	1	1	0	3	414
Standard error	27.44	30.52	36.01	40.20	62.66	208.91	368.54	104.95	R	R	0	497.46	28.18
Average basal area	36	50	62	82	97	96	121	113	128	79	0	49	72

[1]See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 17.--*Estimated volume per acre yield from growing-stock trees for the aspen type on sites having site indexes 81 to 90 in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	0	0	18.65	1.11	24.20	0	0	0	0	0	0	0	6.89
Red pine	0	0	7.10	9.94	14.68	0	0	0	0	0	0	0	6.94
Jack pine	22.97	5.24	0	0	5.49	0	0	0	0	0	0	0	5.32
White spruce	2.18	4.77	0	9.68	0	0	0	0	0	0	0	0	4.62
Black spruce	0	2.85	0	.80	0	0	0	0	0	0	0	0	.68
Balsam fir	7.28	14.42	23.31	26.97	11.75	0	0	0	0	0	0	0	18.78
Hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0
Tamarack	0	2.48	0	0	16.61	0	0	0	0	0	0	0	2.61
Northern white-cedar	0	0	0	7.04	28.11	0	0	0	0	0	0	0	6.50
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32.43	29.76	49.07	55.54	100.84	0	0	0	0	0	0	0	52.35
HARDWOODS													
White oak	0	0	8.13	15.38	26.23	39.73	0	0	0	0	0	0	11.49
Select red oak	2.48	3.39	10.62	65.42	50.69	243.86	0	0	0	0	0	0	38.73
Other red oak	6.59	0	3.58	4.76	26.47	0	0	0	0	0	0	0	7.14
Hickory	0	0	0	0	2.45	0	0	0	0	0	0	0	.34
Yellow birch	3.56	1.97	4.98	3.64	5.30	0	0	0	0	0	0	0	3.79
Hard maple	6.24	0	4.22	9.54	24.01	15.20	0	0	0	0	0	0	8.93
Soft maple	6.93	15.38	16.12	49.38	92.61	0	0	0	0	0	0	0	37.16
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	2.20	9.26	2.48	15.46	31.75	24.89	0	0	0	0	0	0	12.63
Balsam poplar	12.85	0	0	9.91	0	0	0	0	0	0	0	0	5.88
Cottonwood	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper birch	28.55	21.85	50.38	90.93	67.88	0	0	0	0	0	0	0	59.62
Bigtooth aspen	13.04	42.77	111.70	247.19	541.80	323.49	0	0	0	0	0	0	199.92
Quaking aspen	100.36	173.21	366.26	572.72	559.58	1,075.13	0	0	0	0	0	0	413.35
Basswood	0	0	3.30	0	9.30	0	0	0	0	0	0	0	1.83
Butternut	0	0	0	1.91	6.53	48.10	0	0	0	0	0	0	2.52
Black walnut	12.12	9.38	30.10	4.24	22.28	23.56	0	0	0	0	0	0	13.45
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	194.91	277.23	611.87	1,090.47	1,466.87	1,793.95	0	0	0	0	0	0	816.79
Total all species	227.34	306.99	660.93	1,146.01	1,567.70	1,793.95	0	0	0	0	0	0	869.14
Number of plots	27	21	27	60	22	3	0	0	0	0	0	0	160
Standard error	31.60	44.54	77.65	56.93	120.98	676.51	0	0	0	0	0	0	49.99
Average basal area	37	63	68	91	109	98	0	0	0	0	0	0	77

[1]See page 21 for definition of forest types and pages 21 and 22 for species group.

Table 18.--*Estimated volume per acre yield from growing-stock trees for the aspen type on sites having site indexes 91 to 100 in Wisconsin by species group and stand age*[1]

(In cubic feet)

Species group	Stand age class (years)												All classes
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121+	
SOFTWOODS													
White pine	0	0	4.81	0	0	0	0	0	0	0	0	0	1.56
Red pine	0	0	0	0	37.15	0	0	0	0	0	0	0	5.46
Jack pine	0	12.08	0	0	0	0	0	0	0	0	0	0	1.78
White spruce	0	0	0	0	0	0	0	0	0	0	0	0	0
Black spruce	0	0	0	0	0	0	0	0	0	0	0	0	0
Balsam fir	0	0	0	25.23	0	0	0	0	0	0	0	0	5.94
Hemlock	0	0	0	0	0	0	0	0	0	0	0	0	0
Tamarack	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern white-cedar	0	0	0	0	0	0	0	0	0	0	0	0	0
Other softwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	12.08	4.81	25.23	37.15	0	0	0	0	0	0	0	14.73
HARDWOODS													
White oak	0	21.53	23.14	33.25	50.58	0	0	0	0	0	0	0	25.91
Select red oak	12.77	0	0	58.63	226.42	0	0	0	0	0	0	0	48.97
Other red oak	0	10.95	11.13	25.24	0	0	0	0	0	0	0	0	11.15
Hickory	0	0	0	23.57	0	0	0	0	0	0	0	0	5.55
Yellow birch	0	7.02	0	0	24.51	0	0	0	0	0	0	0	4.64
Hard maple	0	0	0	0	0	0	0	0	0	0	0	0	0
Soft maple	22.92	0	10.49	8.21	11.06	0	0	0	0	0	0	0	10.32
Beech	0	0	0	0	0	0	0	0	0	0	0	0	0
Ash	0	0	29.20	30.82	68.58	0	0	0	0	0	0	0	26.78
Balsam poplar	0	0	0	0	61.46	0	0	0	0	0	0	0	9.04
Cottonwood	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper birch	0	12.50	38.57	125.98	96.57	0	0	0	0	0	0	0	58.16
Bigtooth aspen	25.06	0	71.72	410.52	781.37	0	0	0	0	0	0	0	238.39
Quaking aspen	162.02	177.69	631.33	416.80	167.61	0	0	0	0	0	0	0	376.93
Basswood	0	0	0	16.91	0	0	0	0	0	0	0	0	3.98
Butternut	0	0	3.60	0	0	0	0	0	0	0	0	0	1.17
Black walnut	13.19	0	20.34	7.79	104.84	0	0	0	0	0	0	0	25.77
Black cherry	0	0	0	0	0	0	0	0	0	0	0	0	0
Elm	0	0	0	0	0	0	0	0	0	0	0	0	0
Other hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0
Noncommercial spp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	235.96	229.69	839.51	1,157.71	1,593.00	0	0	0	0	0	0	0	846.75
Total all species	235.96	241.77	844.32	1,182.94	1,630.15	0	0	0	0	0	0	0	861.48
Number of plots	5	5	11	8	5	0	0	0	0	0	0	0	34
Standard error	126.41	72.67	112.06	194.19	233.89	0	0	0	0	0	0	0	106.28
Average basal area	26	56	80	101	108	0	0	0	0	0	0	0	77

[1] See page21 for definition of forest types and pages 21 and 22 for species group.

APPENDIX I.--FOREST TYPES

A classification of forest land based upon the species forming a plurality of live-tree stocking. Major forest types in Wisconsin are:

Jack pine.--Forests in which pine species comprise a plurality of the live tree stocking, with jack pine the most common. (Common associates include aspen, white birch, maple, balsam fir, cherry, and oak.)

Red pine.--Forests in which pine species comprise a plurality of the live-tree stocking, with red pine the most common. (Common associates include aspen, white birch, maple, balsam fir, and red oak.)

White pine.--Forests in which pine species comprise a plurality of the live-tree stocking, with eastern white pine the most common. (Common associates include hemlock, aspen, white and yellow birch, and maple.)

Balsam fir-white spruce.--Forests in which balsam fir or white spruce, singly or in combination, comprise a plurality of the live-tree stocking. (Common associates include white-cedar, black spruce, tamarack, maple, birch, hemlock, and aspen.)

Black spruce.--Forests in which swamp conifers (black spruce, tamarack, and northern white-cedar) comprise a plurality of the live-tree stocking, with black spruce the most common.

Northern white-cedar.--Forests in which swamp conifers comprise a plurality of live-tree stocking, with northern white-cedar the most common.

Tamarack.--Forests in which swamp conifers comprise a plurality of live-tree stocking, with tamarack the most common.

Oak-hickory.--Forests in which upland oaks or hickories, singly or in combination, comprise a plurality of the live-tree stocking. (Common associates include aspen, cherry, balsam fir, elm, maple, and white birch.)

Elm-ash-cottonwood.--Forests in which lowland elm, ash, or cottonwood, singly or in combination, comprise a plurality of the live-tree stocking. (Common associates include maple, basswood, and river birch.) These forests may be subtyped cottonwood when it is the most common species.

Maple-beech-birch.--Forests in which maple, beech, yellow birch, or upland elm, singly or in combination, comprise a plurality of the live-tree stocking. (Common associates include hemlock, elm, basswood, white pine, and white and yellow birch.) Locally this type is called "northern hardwoods."

Aspen.--Forests in which a mixture of quaking or bigtooth aspen, or balsam poplar, singly or in combination, comprise a plurality of the live-tree stocking. (Common associates include maple, white birch, balsam fir, red and northern pin oak, and cherry.)

Paper birch.--Forests in which paper birch comprises a plurality of the live-tree stocking. (Common associates include aspen, maple, balsam fir, red and northern pin oak, and cherry.)

APPENDIX II. SPECIES GROUPS

SOFTWOODS

Species Group	Scientific Name
White pine	*Pinus strobus*
Red pine	*Pinus resinosa*
Jack pine	*Pinus banksiana*
White spruce	*Picea glauca*
Black spruce	*Picea mariana*
Balsam fir	*Abies balsamea* var. *balsamea*
Hemlock	*Tsuga canadensis*
Tamarack	*Larix laricina*
Northern white-cedar	*Thuja occidentalis*
Other softwoods	*Juniperus virginiana*
	Pinus sylvestris
	All other softwoods

HARDWOODS

White oak	*Quercus alba*
	Quercus bicolor
	Quercus macrocarpa
	Quercus muehlenbergii

Species Group	Scientific Name
Select red oak	*Quercus rubra*
Other red oak	*Quercus palustris*
	Quercus velutina
Hickory	*Carya cordiformis*
	Carya ovata
	Carya tomentosa
Yellow birch	*Betula alleghaniensis*
Hard maple	*Acer nigrum*
	Acer saccharum
Soft maple	*Acer rubrum* var. *rubrum*
	Acer saccharinum
Beech	*Fagus grandifolia*
Ash	*Fraxinus americana*
	Fraxinus nigra
	Fraxinus pennsylvanica
Balsam poplar	*Populus balsamifera*
Cottonwood	*Populus deltoides*
Paper birch	*Betula nigra*
	Betula papyrifera var. *papyrifera*
Bigtooth aspen	*Populus grandidentata*
Quaking aspen	*Populus tremuloides*
Basswood	*Tilia americana*
Butternut	*Juglans cinerea*
Black walnut	*Juglans nigra*
Black cherry	*Prunus serotina*
Elm	*Ulmus americana*
	Ulmus rubra
	Ulmus thomasii
Other hardwoods	*Acer negundo*
	Celtis occindentalis
	Gleditsia triacanthos
	Nyssa sylvatica var. *sylvatica*
	Platanus occidentalis
	All other hardwoods
Noncommercial species	

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Forest type	Unit I (Northeastern)	Unit II (Northwestern)	Unit III (Central)	Unit IV (Southwestern)	Unit V (Southeastern)	Statewide
Jack pine	1	13	25	37	NA	55
Red pine	2	14	26	38	45	56
White pine	3	15	27	39	46	57
Balsam fir-White spruce	4	16	28	NA[1]	47	58
Black spruce	5	17	29	NA	NA	59
Northern white-cedar	6	18	30	NA	48	60
Tamarack	7	19	31	NA	49	61
Oak-Hickory	8	20	32	40	50	62
Elm-Ash-Cottonwood	9	21	33	41	51	63
Maple-Beech-Birch	10	22	34	42	52	64
Aspen	11	23	35	43	53	65
Paper birch	12	24	36	44	54	66

See page 21 for definition of forest types and figure 1 for boundaries of Forest Survey Units. Then circle numbers for table sets desired and return this order blank to: PUBLICATIONS, North Central Forest Experiment Station, Folwell Avenue, St. Paul, Minnesota 55108.

[1]NA = not available.

Essex, Burton L., and Jerold T. Hahn.
1976. Empirical yield tables for Wisconsin. USDA For. Serv. Gen. Tech. Rep. NC-25, 22 p., illus. North Cent. For. Exp. Stn., St. Paul, Minn.

Describes the tables derived from the 1968 forest survey of Wisconsin. These tables are broken down according to Wisconsin's 5 Forest Survey Units, 12 forest types, and 5 site index classes. Presents 18 tables as examples of the more than 500 that can be ordered by using the order form enclosed in the publication.

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